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Field Campaign Guidelines

N Hickmon

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ARM

DISCLAIMER

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N Hickmon, Argonne National Laboratory

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Acronyms and Abbreviations

AAF	ARM Aerial Facility
AFC	ARM Field Campaign
AMF	ARM Mobile Facility
ADO	Associate Director for Operations
ARM	Atmospheric Radiation Measurement
ASR	Atmospheric System Research
BER	DOE Office of Biological and Environmental Research
COA	Certificate of Authorization
DOE	U.S. Department of Energy
Co-I	co-investigator
EESSD	Earth and Environmental Systems Sciences Division
EMSL	Environmental Molecular Sciences Laboratory
ENA	Eastern North Atlantic
FAA	Federal Aviation Administration
FICUS	Facilities Integrating Collaborations for User Science
IMB	Infrastructure Management Board
IOP	intensive operational period
NSA	North Slope of Alaska
OLI	Oliktok Point
PI	principal investigator
SGP	Southern Great Plains
TBS	tethered balloon system
UAS	uncrewed aerial systems
UAV	uncrewed aerial vehicle
VAP	value-added product

Definitions

ARM – Atmospheric Radiation Measurement (ARM) is a U.S. Department of Energy scientific user facility (http://www.arm.gov).

ARM user facility – The integrated infrastructure and system of instruments, network, and data system components associated with ARM sites.

ASR – The Atmospheric System Research program was formed from the merger of the former ARM science program and the Atmospheric Science Program. Through a strong collaboration with ASR, ARM seeks scientific input from both ASR and the broader research community to ensure that it is responsive to the community's observational needs.

Collaborating Program – A program joining with ARM to pursue a specific set of objectives by providing resources and participating in active planning and executing of an ARM field campaign.

Cooperating Program – A program or agency supporting a specific ARM field campaign, for which ARM provides the resources.

External Data – Data that do not originate from within ARM; data may have been observed at ARM facilities, but processing and quality control were performed by another program or agency and captured by ARM through the ARM Data Center. Typically, ARM would not add additional data quality efforts to data already quality controlled by another agency or program.

ARM Field Campaign –A scheduled, collaborative field effort in which individual researchers or an outside agency or program cooperates with ARM to acquire a data set to meet a defined research or science need. Field campaigns have previously been called intensive operational periods.

ARM Field Campaign Request – The request submitted to ARM, by a principal investigator, describing the proposed field campaign activities for consideration. ARM management uses information submitted via the form to review and determine the disposition of the request to use the facility. The request form can be accessed at (https://www.arm.gov/research/campaign-proposal).

Facility code – Sub-site designation for fixed-site extended facilities (i.e., E32, E42), mobile facility supplemental sites (i.e., S1, S2), and aircraft (i.e., F1, U1).

Intensive Operational Period – A period within a field campaign designated for intensive focus on instrument operation, additional instrumentation or asset operation, and/or distinction between multi-observatory operations.

Metadata – Described as "information or data about the data." Typically refers to information about primary data, which are usually numerical, or information describing aspects of the primary data. Such information could include instrument site information, environmental conditions under which data were acquired, and any other data needed to understand the primary data.

Near-Real Time – When referred to in textual references, this term is considered to be "with a few hours' delay."

Observatory – set of infrastructure designed to conduct measurement activities with ARM instrumentation and collaborative efforts. Observatories: AAF, AMF1, AMF2, AMF3, ENA, NSA, SGP, OSC (designation for activities not associated with another observatory).

Preliminary Data – Data that have not necessarily been subjected to review, quality control, and/or documentation by a responsible investigator. Preliminary data are not considered publishable without the coordination and concurrence of the responsible investigator. Generally applicable only to field campaign efforts for which data from sources beyond routine ARM data are being acquired.

Quality-Assured Data – Typically, the final form of data to be submitted to the ARM Data Center. This includes datastream description documentation, fully calibrated data expressed in commonly used geophysical units, quality-flagged data files, and all ancillary data (metadata) needed to make the datastream understandable to a future user.

Site – a selected location, designated with a site code, where an observatory or ARM activity occurs. Examples: OLI, NSA, MOS, ENA, SGP.

Contents

1.0 Purpose

This document provides guidelines for the Atmospheric Radiation Measurement (ARM) user facility for submitting, selecting, planning, executing, and closing out field campaigns. Important detailed information regarding these ARM field campaigns is provided in appendices to this document.

- Appendix A − Roles and Responsibilities
- Appendix B − Annual ARM Facility Field Campaign Proposal and Implementation Schedule
- Appendix C − Request for Proposal Formats
- Appendix D − Links.

2.0 Field Campaign Process

Proposals for a field campaign can originate with any scientist. Proposed campaigns should focus on research that addresses the ARM Mission (https://www.arm.gov/about/mission-and-vision-statements) of improving the understanding and representation of clouds and aerosols in earth system models, as well as their interactions and coupling with the Earth's surface. Priority will be given to proposals that 1) make comprehensive use of ARM facilities, 2) focus on strategic goals of the U.S. Department of Energy (DOE) Office of Biological and Environmental Research (BER), and 3) have the ability to improve regional or global earth system models. Proposals that coordinate with other BER community capabilities, such as the Environmental Molecular Sciences Laboratory, AmeriFlux Network, and Next-Generation Ecosystem Experiments in the Arctic and Tropics, are encouraged.

Types of proposals considered by ARM include:

- **Annual Facility Call** – Deployment of an ARM Mobile Facility (AMF), ARM Aerial Facility (AAF), or complex campaigns at a fixed ARM site. Facility calls are accepted and reviewed once annually by the ARM Science Board.
- **Small Campaigns** – Deployment of guest instruments at an ARM observatory; deployment of ARM instruments away from ARM observatories; or special operations, such as enhanced radiosonde launch schedules; special instrument scanning strategies at a fixed site or mobile facility; or specific, targeted add-ons to larger, previously approved AMF campaigns. Proposals for small campaigns are accepted any time and reviewed quarterly by the ARM Infrastructure Management Board and DOE.
- **Tethered Balloon System (TBS) Deployments** – In a typical year, ARM expects to conduct approximately six to eight TBS missions, with each mission lasting two weeks.

Appendix B defines the timeline and process for each type of field campaign.

A detailed description of the field campaign proposal process follows:

- **Proposals, as received through the ARM website and communicated to the Infrastructure Management Board (IMB)** – An initial review of the preproposal and any additional information request to the principal investigators (PIs) will normally be communicated within four weeks. The communication can include a request for clarifying information, request for an abbreviated or a full proposal, and/or information regarding the review timeline. The following criteria are used in a

review of the preproposal to evaluate the use of the facility, potential collaborations, costs, and logistics:

- Level 1
  - Cost to ARM is less than $25K
  - IMB review/approval will be quarterly (i.e., January, April, July, and October)
  - No abbreviated or full proposal is required
  - Campaign start date will be at least 30 days after approval month
- Level 2
  - Cost to ARM is $25K to $100K
  - IMB review and a scientific peer review will be quarterly (i.e., January, April, July, and October)
  - Abbreviated proposal may be required
  - Campaign start date will be at least 60 days after approval month
- Level 3
  - Cost to ARM is $101K to $300K
  - Scientific peer review and/or select ARM Science Board member review will occur semi-annually (i.e., April and October)
  - Abbreviated proposal will be required
  - Campaign start date will be at least 90 days after approval
- Level 4
  - Deployment of an AMF, AAF, or large fixed-site campaign with costs exceeding $300K will be considered annually during the "annual facility call"
  - IMB logistics and feasibility review will be conducted
  - ARM Science Board review will be conducted
  - Full proposal is required
  - Reviews will be conducted annually.

- **Additional Notes:**
  - For proposals seeking to add instruments or measurements to previously approved large AMF, AAF, UAS, or fixed-site campaigns, a preproposal submission date will be established. Additional requests will follow the regular proposal timeline above with the estimated cost and timeline of 30, 60, or 90 days post approval month. Once a final submission date has been established, add-on requests to the proposal will no longer be accepted.
  - Outside of AMF1/AMF2/AAF supported activities, it is unlikely that an additional Level 4 campaign could be supported in a given year.

– For requests at Level 2 or higher, the scientist may be invited to submit a "full proposal" or an "abbreviated proposal." (See Appendix C for full and abbreviated proposal formats.) Invited proposals are delivered to the ARM field campaign administrator, who will initiate the review process. For full proposals, the review process has two primary dimensions. First, the IMB and observatory managers analyze the field campaign to refine and communicate costs, logistics (e.g., local, national, international), schedule, and other impacts associated with the implementation. Second, the full proposal is transmitted for scientific peer review by ad hoc peer reviewers or a subset of the Science Board. The ARM field campaign administrator facilitates these communications and records and tracks all proposals and related information.

The Science Board,[1] which is an independent panel established by DOE to review proposals for use of ARM, provides scientific peer reviews for each Level 4 proposal, and may also be asked to review Level 3 proposals, depending on cost/complexity. An important consideration for any ARM campaign is how well the proposed field campaign facilitates discovery-based research relevant to the mission of the DOE BER Earth and Environmental Systems Sciences Division (EESSD). The EESSD Strategic Plan is located at https://science.osti.gov/-/media/ber/pdf/workshop-reports/2018_CESD_Strategic_Plan.pdf?la=en&hash=0823BBAAF5C13D42AC1F193257BEC66300A7E068.

The following criteria are used for the scientific review of Level 2 and above proposals:

- Scientific and/or technical merit of the project, including the likelihood that the research will lead to new discoveries or fundamental advances within its field or have substantial impact on progress in that field or other scientific fields.
- Appropriateness of the proposed method or approach. For example, are the proposed measurements and/or experimental design suitable to meet the scientific objectives?
- Competency of applicant's personnel and adequacy of proposed resources.
- Reasonableness and appropriateness of the requested ARM resources for the proposed activity. (Reviewers may be asked to comment separately on major resources requested.)
- Does the proposal clearly describe the relevance of the proposed activities to the DOE Office of Biological and Environmental Research (BER), including relevance to ARM and/or to other science programs within BER?

For Level 2 and above proposals, DOE program management uses the scientific peer reviews and logistical reviews from the ARM IMB and/or other infrastructure staff, along with DOE programmatic considerations, to make final decisions.

For approved field campaigns, the proposing scientist develops an abstract for public distribution. For some field campaigns (including all Level 3 and 4 campaigns), the proposing scientist will also develop a science plan. For most small (Level 1 and 2) field campaigns, no science plan is required. There are exceptions, however, depending on the scope, cost, or complexity of the proposed work. Approved field campaigns and experiments are planned, tracked, and implemented by ARM.

[1] https://www.arm.gov/connect-with-arm/organization/science-board

3.0 Planning and Execution

Planning, executing, and reporting of an ARM field campaign are processes that require active tracking. The following sections delineate field campaign responsibilities and the required documentation.

3.1 Principal Investigator Roles and Responsibilities

Once a field campaign is accepted, lead PIs will be expected to complete the actions described below.

1. **Abstract** – An abstract for all approved ARM field campaigns is required shortly after approval. The abstract will appear on an individual ARM field campaign web page.

2. **Science Plan** – A science plan is prepared by the lead scientist within 90 days after DOE's notification of campaign approval for Level 4 campaigns (e.g., AMF and AAF deployments) and within 30 days for smaller campaigns (i.e., Levels 2 and 3) when applicable. The science plan will define co-investigator roles and expected participation in the campaign. The science plan will define relationships and collaborations including ARM instrumentation, visiting instruments, aerial measurements, aerosol science and engineering, radar science and engineering, and modeling science areas. The science plan also will include a measurement priority list to confirm critical measurements proposed. ARM will make the science plan publicly available on the individual ARM field campaign web page. The science plan can consist primarily of material from the project description section of the ARM field campaign proposal, if desired, but it should be updated to address any changes to the project resulting from the science and/or logistical reviews.

3. **Availability** – Lead scientists will participate in campaign planning by providing scientific guidance and input requested by the ARM observatory manager or ARM technical director to guide ARM operations.

4. **UAS and TBS Aviation Safety Plan**– Lead scientists, or their delegate, will prepare an aviation safety plan to be reviewed and iterated until approval, in accordance with ARM-related UAS and TBS operational requirements and approval document (https://www.arm.gov/publications/programdocs/doe-sc-arm-19-022.pdf)

5. **PI Data Plan** – A data plan is required for any campaign involving guest instrumentation. Complexity depends upon type and volume of data involved. A data plan should include the following:

   a) Anticipated data set name, description, associated instrument, and point of contact

   b) Date ranges in which you expect the instrument to be operating

   c) Anticipated overall data size, including supplementary files, if applicable

   d) Data archival location, such as an external site, or ARM Data Center

   e) Data submission type (continuously, one-time) and submission date(s)

   f) Data formatting guideline.

6. **Data Submission** – Final quality-assured data along with metadata for all non-ARM instruments are required to be released to the ARM Data Center within six months after completion of the field campaign.

7. **Final Report** – A final report of the campaign outcome is required to be submitted to the ARM field campaign administrator within six months after completion of the field campaign.

3.2 ARM Planning Activities and Responsibilities

ARM activities are internally tracked in a workflow that includes standardized processes for collecting critical information, such as the campaign dates, instrumentation needed, documentation, etc.

1. **Planning** – Upon DOE approval of a field campaign, formative planning and execution documents are developed as needed to ensure that all preparations are made for a successful campaign. The observatory manager is responsible for engagement and coordination with the lead scientist, host sites, and ARM infrastructure.

   Depending on campaign complexity, there may be multiple planning documents, such as for a mobile or fixed site as well as aircraft-related planning documents.

2. **ARM Data Management Plans** – Data management plans document the collection and processing of data associated with a field campaign and associated technical elements, such as the establishment of communications with a remote site.

3. **Instruments and Products Spreadsheet** – Prepared by the designated points of contact as needed, the spreadsheet includes a list of ARM instruments, guest instruments (ARM and collaborative), and value-added products, as well as a summary of the datastreams expected by the ARM Data Center.

3.3 Data Responsibilities

Data acquired must be of sufficient quality to be useful and must be documented such that users will be able to clearly understand their meaning, organization, and quality.

Final quality-assured data sets will be retained in the ARM Data Center and will be accessible from there. Once submitted in final form, data sets will be freely accessible to the general scientific community. The only exception to "free-and-open" access would be a specific circumstance in which ARM purchased a limited distribution data set for the specific use of science team members.

Preliminary data may be shared among field campaign participants during and shortly following the campaign. To facilitate sharing, a restricted access capability will be established by the ARM Data Center for campaigns, if requested by the PI. Access will be limited to participants and data managers. The data policy will be governed by the ARM data policies, if appropriate.

3.3.1 General Guidelines for Field Campaign Data

ARM-sponsored data will be released in the following general spirit of the basic tenets of a user facility:

- "Free-and-open" sharing of data

- Immediate processing and sharing by PIs in the field, if at all possible
- Timely release to collaborating science teams and general scientific community through the ARM data system.

Collaborating programs are encouraged to follow the ARM data protocols of timely release and free-and-open sharing.

All data to be submitted to the ARM data system will be accompanied by full documentation in accordance with the data management and documentation plan.

Planning for field campaigns will include specific plans for data reduction, evaluation, and publication.

3.3.2 Data Processing and Handling

There are two classes of field campaign data:

- **Routine Data from ARM Measurements** – Routine ARM data (i.e., collected from fixed, mobile, and aerial facilities) are available to all participants on a free-and-open basis as they become available and are publishable upon receipt with acknowledgment of ARM as the source. These data are accessible through the ARM Data Center using the Data Discovery browser (https://adc.arm.gov/discovery/).
- **Guest Instrument Data** – Final data from a PI must be quality assured, documented, and released to the ARM Data Center as soon as possible after collection, but no later than six months from the date of completion of the field campaign.

When final data are released to the ARM Data Center, the data are considered publishable. Users are cautioned to confirm the data version with the responsible PI prior to publication.

If requested, the ARM Data Center will provide registered participants with early (or preliminary) access to acquired data for the purpose of assessing data quality only.

The ARM Data Center will track data versions and ensure that only the latest data versions are provided to data recipients, unless earlier versions are specifically requested. Participants may release their own preliminary data to whomever they wish; however, preliminary data of other PIs will be shared only with consent from the originator of the data. All final data sets acquired during a field campaign will be made available for dissemination to users through the ARM Data Center and the ARM website.

3.3.3 Data Submission

If preliminary data exist, they will be submitted to a password-protected area of the ARM Data Center. All final data sets will be submitted to the ARM Data Center. The steps for delivering final data to the ARM Data Center are available at https://www.arm.gov/research/campaigns/submitting-data.

The ARM Data Center will review final data sets for data content and readability, documentation, and visualization of example data. Final data sets must be viewed as standalone data sets and useable by the general scientific community.

3.3.4 Acknowledgments

The ARM user facility should be acknowledged in publications as the origin of field studies or data used in the research. Following are guidelines for proper acknowledgments.

Publications using ARM data or facilities are asked to acknowledge that:

"Data were obtained from the Atmospheric Radiation Measurement (ARM) user facility, a U.S. Department of Energy Office of Science user facility sponsored by the Office of Biological and Environmental Research."

Authors should also properly acknowledge data provided by PIs or data originating from other cooperating or collaborating programs. In addition, ARM suggests offering co-authorship to an instrument mentor, data translator, or other ARM staff if they contributed substantially to the research or measurement beyond routinely providing data. Information on contacting instrument mentors and data translators about specific datastreams or data products should also be included.

Authors are encouraged to use digital object identifiers, or DOIs, to reference data in publications. See the DOI Guidance for Datastreams (https://www.arm.gov/working-with-arm/acknowledging-arm/doi-guidance-for-datastreams) for more information on citing ARM data.

Investigators who receive ARM support (e.g., logistical support for guest instrument deployments or ARM mentor support) should also use the following acknowledgment:

"This research was supported by the Office of Biological and Environmental Research of the U.S. Department of Energy *(under grant or contract number—if appropriate)* ***as part of the Atmospheric Radiation Measurement (ARM) user facility, an Office of Science user facility."***

In addition, the ARM Communications Team must be notified of any articles submitted for publication as a result of the field campaign. You may submit your articles to ARM's publication database at https://www.arm.gov/research/publications/submit.

Appendix A

Roles and Responsibilities

ARM Data Center – The ARM Data Center is the gateway for all final campaign data sets being submitted for general release and for long-term retention in the ARM Data Center. The ARM Data Center will ensure that the appropriate standards for data set submission have been met before data are made available to users.. The ARM Data Center establishes and maintains an externally accessible, password-protected, preliminary data file area for which access can be limited to participants until the final data are released to the ARM Data Center. The ARM Data Center also is responsible for keeping the online archive of final field campaign data submissions safe and making the data available to end users in a way that tracks individual requests.

Associate Director for Operations – The associate director for operations is responsible for ensuring efficient, effective, and continuous operation of instruments and data systems. The associate director for operations works with observatory managers to ensure that field campaigns are conducted in accordance with applicable DOE and national laboratory safety and security policies.

Field Campaign Lead Scientist – The field campaign lead scientist, also known as a principal investigator or PI, is responsible for coordinating scientific activities and collaborating with ARM site operations regarding schedules and the use of resources within the scope and identified constraints of the planned activities. The observatory manager has the final decision on safety issues. Finally, the field campaign lead scientist is responsible for the science plan, periodic reports (e.g., potentially through blogs or journals on the field campaign site), a final "findings" report, and submission of data to the ARM Data Center.

Field Campaign Participants – Field campaign participants are responsible for their own scientific efforts. In the field, each participant has the responsibility to either report their activity periodically to the observatory manager and other participants, or make reports to the lead scientist for integration into a larger report. Each participant is responsible for contributing to the final campaign report and making certain that data are quality assured, documented, and submitted in accordance with ARM procedures.

Infrastructure Management Board – The Infrastructure Management Board (IMB) consists of the technical director, associate director for operations, observatory managers, data services manager, engineering and process manager, and instrument operations manager. The IMB assesses the impacts of all requests for use of ARM and screens science requests for use of the user facility prior to consideration by the ARM Science Board.

Instrument Operations Manager – The instrument operations manager coordinates the ARM instrument mentor activities and monitors instrument developments and operations.

ARM Field Campaign Administrator – The ARM field campaign administrator is responsible for coordinating the overall field campaign screening process with ARM management and serves as the communication link between the IMB and the PI during the review processes as well as IMB and proposal science reviewers.

ARM Observatory Managers – Observatory managers are responsible for integrating the support requirements indicated in each of the science plans into a field campaign operations plan and for coordinating site operations. Finally, each observatory manager is responsible for ensuring safe operations and has the final decision authority for scheduling and daily planning where safety is a concern for the ARM observatory they manage.

Science Translators – Science translators are liaisons between the science community and ARM infrastructure staff. Science translators are responsible for developing value-added products (VAPs) that meet the scientific data needs of the community, understanding the scientific objectives of field campaigns, and coordinating with PIs to develop the VAP plan for a specific field campaign. Once an AMF campaign proposal is awarded, a translator single point of contact will be assigned for each mobile facility deployment and will work with the PI to develop the VAP plan prior to each campaign.

Technical Director – The ARM technical director has the overall responsibility to ensure, by working with the observatory manager, that all field campaign activities are fully coordinated; to identify and arrange for all participants; and to ensure that all plans and documents are completed and submitted as appropriate.

Appendix B

Annual ARM Facility Field Campaign Proposal and Implementation Schedule

B.1 Typical Large Campaign Proposal Schedule

The nominal schedule for the large (Level 3 and 4) field campaigns is given below. This schedule may vary somewhat from year to year, so investigators are encouraged to check the ARM website for the most up-to-date schedule.

December – Preproposal call announced for large, comprehensive proposals that require vetting by the ARM Science Board. The time span for preproposals is the current fiscal year plus 2 years (n+2). For example, the proposal call in January 2019 is for proposals taking place in fiscal year 2021. The proposal announcement is sent to the "ARM-all" mailing list and posted in periodicals: that is, *Bulletin of the American Meteorological Society*, American Geophysical Union *Eos Earth & Space Science News*, and on the ARM News Center.

Early April – Preproposals are due.

Mid-April – Notifications are sent for full proposals.

Early August – Full proposals are due.

October – Infrastructure costs and logistics analysis are completed.

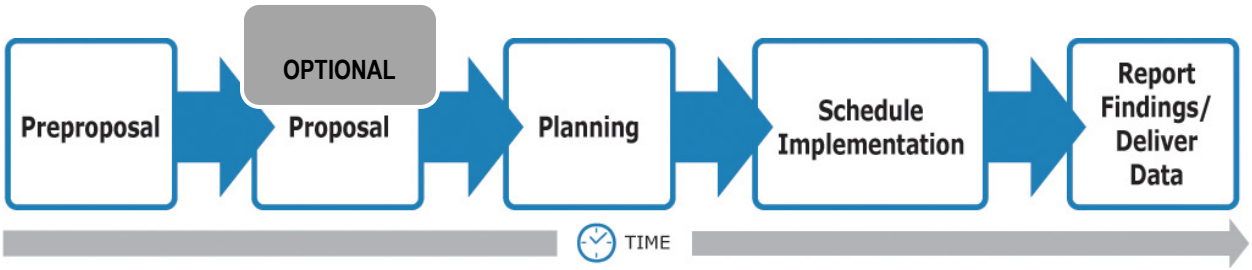
November – Science Board reviews are conducted.

January – Decisions for campaigns at fixed, mobile, and aerial observatories are announced.

B.2 Large Campaign Implementation Schedule

1. Science and operations plans are developed.
2. Field campaign is executed.
3. Six months after end of campaign—all collaborative data submitted to the ARM Data Center and the final campaign report sent to the ARM field campaign administrator.

B.3 Small Field Campaign Process



1. Requests (preproposals) for smaller field campaigns are open year-round, limited by cost and potential science impact. Examples of smaller field campaigns include instrument validation or data studies that take place at one of the fixed sites.

2. Reviews are conducted by the Infrastructure Management Board (IMB) and relevant site operations staff. DOE adds additional reviewers as required.

3. Proposals are reviewed for impacts within 30 days of receipt. Proposal decisions will be made quarterly during January, April, July, and October.

4. ARM field campaign administrator sends the decision based on IMB/DOE decision.

5. Science plan and/or data plan are developed (if required).

6. Field campaign is planned and executed.

7. Extension requests may be considered with the submission of an interim report and data submission.

8. All collaborative data submitted to the ARM Data Center within six months after end of campaign.

9. A final field campaign report is sent to the ARM field campaign administrator by email by six months after end of campaign.

B.4 Tethered Balloon System Request Form

There are two types of tethered balloon system (TBS) requests: requests for a TBS mission (where a "mission" typically represents a two-week deployment of a TBS) and requests to deploy guest instruments on a TBS as part of a previously approved mission. The latter type of request should be submitted by following the small field campaign process with reference to the approved TBS mission. This section describes the process for requesting a new TBS mission.

There will be at least one and, where possible, two calls for TBS missions each year. The nominal schedule for the first proposal cycle of the year is given below. This first call is coordinated with the annual Facilities Integrating Collaborations for User Science (FICUS) call (https://www.emsl.pnnl.gov/basic/ficus-project-information/1872). The FICUS call provides access to both the ARM TBS and Environmental Molecular Sciences Laboratory (EMSL) aerosol particle sampler along with access to laboratory instruments for aerosol particle analysis. Like ARM, EMSL is a DOE

Office of Science user facility. Requests that propose to make use of the EMSL particle sampler should submit proposal materials through the ARM/EMSL FICUS proposal interface. Requests that do not require the EMSL particle sampler should submit preproposals (equivalent to the "Letters of Intent" in the FICUS process) through the ARM form on the ARM field campaign web page. The timing for both processes is the same.

January – Letters of intent due

February – Invitation of proposals

March – Full proposals due

July – Notice of decision

October – Project begins

If there is sufficient capacity for additional TBS missions in the upcoming fiscal year, a second TBS call will be opened. Proposals for this second call must be submitted through the ARM field campaign web page and will follow the schedule below. Specific dates will vary, so investigators are encouraged to check the ARM website for the most up-to-date schedule.

July – Preproposals due

August – Invitation of proposals

September – Full proposals due

December – Notice of decision

March – Project begins

Appendix C

Request for Proposal Formats

The required elements for full and abbreviated ARM campaign proposals are given below. Page limits for each proposal section are listed, where relevant. Proposals should be in 12-point font with page margins of at least 1 inch on all sides.

C.1 Full Proposal

A full proposal is expected to include the following.

1. **Cover Sheet** *(1 page)* – Must include proposal title, names and institutions of principal investigator (PI) and co-investigators (Co-Is), date and location of proposed activities, and major ARM resources requested (e.g., first or second AMF, AAF capabilities, tethered balloon systems, or fixed observatory, such as Southern Great Plains or Eastern North Atlantic).

   All investigators listed on the cover sheet should have clearly defined roles within the proposal text.

   ARM staff (e.g., instrument mentors, translators, developers, site operations staff, etc.) participating in their ARM roles should not be listed as co-investigators as ARM staff are expected to support all selected campaigns. They may be listed as co-investigators if they are participating in a non-ARM role with non-ARM (e.g., ASR or other) funding.

2. **Proposal Abstract** *(1 page)* – An abstract suitable for publication on the ARM website should be included.

3. **Table of Contents**

4. **Project Description** (*up to 20 pages*) – The primary section of the proposal. Its purpose is to provide the overall science objectives of the campaign and a detailed description of how ARM instrumentation could be used to address these objectives.

   The project description should clearly link the proposed ARM measurements to the science objectives of the campaign. It should include information such as planned instrument deployment and configuration, scanning strategies, critical instruments, and/or flight plans necessary to understand how the measurements will address the science objectives of the campaign. The project description may include a section on analysis and/or process modeling that would use ARM observations to support the science goals and objectives of the proposal. The intent of such a section is to illustrate the scientific potential of the proposed observations. **It is expected that research described in this section will be supported with external (non-ARM) funding.** Please indicate proposed sources of

external research funding and whether the funding is already secured or when funding decisions are expected.

Note: As a DOE Office of Science user facility, ARM generally provides facilities and infrastructure to the scientific community to support scientific research rather than direct funding to PIs for research activities. However, DOE recognizes that a successful AMF deployment requires a significant time commitment by the PI. DOE may consider proposals for a small amount of support for PI or Co-I research activities associated with approved AMF campaign deployments for investigators who do not already have research funding to support their participation in the AMF campaign. The intent of this funding would not be to support all of the science objectives of the campaign described in the Project Description, but to support the PI's ability to participate in pre-campaign scientific planning; provide scientific guidance to ARM for successful campaign operations; and/or perform initial analyses, data set development, modeling, or other research activities to strengthen the value of the AMF campaign data for the scientific community. PIs should contact the DOE ARM program manager directly to discuss potential support.

5. **DOE Mission Relevance** (*1 page*) – A statement of the relevancy of the campaign to the mission of the U.S. Department of Energy (DOE) Office of Biological and Environmental Research Earth and Environmental Systems Sciences Division (EESSD).

   DOE EESSD Strategic Plan: https://ess.science.energy.gov/eessd-strategic-plan/

   ARM Decadal Vision: https://www.arm.gov/publications/programdocs/doe-sc-arm-20-014.pdf.

6. **ARM Resources Required** (*5 pages maximum*) – The full proposal should describe all the ARM observatories needed to complete the campaign.

   Include resources (i.e., facilities, instrumentation, logistical support, guest instrument support, soundings, travel support, and data products) being requested from ARM. Please note that ARM does not purchase equipment in support of individual field campaigns, nor does ARM upgrade infrastructure or instrumentation other than its own.

   This section should also include:

   a. Prioritization of instrument requests (e.g., critical, important, nice to have).

   b. Prioritization of value-added products (VAPs) requested.

   c. Proposed guest instrument deployments and logistical support needed.

   d. Any special instrument configuration requirements (e.g., clusters, ancillary sites, or groupings).

   e. Proposed special instrument operations (e.g., radar scan strategies).

   f. For AAF platforms, potential payload with prioritization, proposed flight plans, and number of flight hours requested.

7. **Tethered Balloon Resources Requested as part of an AMF proposal** (*1 page*) – A tethered balloon system (TBS) may be proposed as part of an ARM Mobile Facility request. Scientists proposing a TBS mission as part of an AMF proposal should provide details regarding payload, flight profile, and other TBS mission requirements as described on the TBS guidelines web page (https://www.arm.gov/policies/campaign-guidelines/tbs).

8. **Collaborative Resources** *(2 pages maximum)* – Include collaborative resources (e.g., facilities, aircraft, instrumentation, and funding) being provided by other institutions.

9. **Data Management Plan** *(1 page)* – This is requested as part of the full campaign proposal and should clearly indicate what data products from PI/guest instrument deployments will be submitted to the ARM Data Center.

   For collaborative resources, indicate the collaborating agency's data policy and how data will be shared with the ARM community.

   Note that routine ARM data are available to all participants from the ARM Data Center on a free-and-open basis as they become available while data and documentation from PI/guest instrument deployments must be submitted to the ARM Data Center no later than six months after the end of the campaign.

10. **References Cited**

11. **Biographies** – Brief biographical sketches of the PI (*2-page limit*) and co-investigators (*1 page*). The role of each co-investigator should be clearly defined in the proposal. Conflict of interest information for each PI and Co-I should be included (but do not count toward the page limits).

12. **Other (Optional)** – Additional appendices/information may be included; however, ***note that reviewers are not required to read appendices*.**

C.2 Abbreviated Proposal

1. **Cover Sheet** *(1 page)* – Must include proposal title, names and institutions of PI and co-investigators, and date and location of proposed activities.

   All investigators listed on the cover sheet should have clearly defined roles within the proposal text.

   ARM staff (e.g., instrument mentors, translators, developers, site operations staff) participating in their ARM roles **should not** be listed as co-investigators as ARM staff are expected to support all selected campaigns. They may be listed as co-investigators if they are participating in a non-ARM role with non-ARM (e.g., ASR or other) funding.

2. **Proposal Abstract** *(1 page)* – An abstract suitable for publication on the ARM website should be included.

3. **Table of Contents**

4. **Project Description** *(6 pages maximum)* – The primary section of the proposal. Its purpose is to provide the overall science objectives of the campaign and a detailed description of how ARM instrumentation could be used to address these objectives.

   The project description should clearly link the proposed ARM measurements to the science objectives of the campaign. It should include information such as planned instrument deployment and configuration, scanning strategies, and critical instruments necessary to understand how the measurements will address the science objectives of the campaign. The project description may include a description of analysis and/or process modeling that would use ARM observations to support the science goals and objectives of the proposal. The intent of such a section is to illustrate

the scientific potential of the proposed observations. **It is expected that research described in this section will be supported with external (non-ARM) funding.** Please indicate proposed sources of external research funding, and whether the funding is already secured or when funding decisions are expected.

5. **DOE Mission Relevance** *(1 page)* – A statement describing the relevancy of the campaign to the mission of the U.S. Department of Energy (DOE) Office of Biological and Environmental Research Earth and Environmental Systems Sciences Division (EESSD).

   DOE EESSD Strategic Plan: https://ess.science.energy.gov/eessd-strategic-plan/

   ARM Decadal Vision: https://www.arm.gov/publications/programdocs/doe-sc-arm-20-014.pdf.

6. **ARM Resources Required** *(2 pages maximum)* – The full proposal should describe all the ARM observatories needed to complete the campaign.

   Include resources (i.e., facilities, instrumentation, logistical support, guest instrument support, special instrument scanning strategies, enhanced soundings, tethered balloon flight parameters, data products, etc.) being requested from ARM. Please note that ARM generally does not purchase equipment in support of individual field campaigns or upgrade infrastructure or instrumentation other than its own.

7. **Data Management Plan** *(1 page)* – A data management plan is requested as part of the campaign proposal.

   Clearly indicate what data products from PI/guest instrument deployments or offsite instrument deployments will be submitted to the ARM Data Center.

   For collaborative projects, indicate the collaborating agency's data policy and how data will be shared with the ARM community.

   Note that routine ARM data are available to all participants from the ARM Data Center on a free-and-open basis as they become available while data and documentation from PI/guest instrument deployments must be submitted to the ARM Data Center no later than six months after the end of the campaign.

8. **References Cited**

9. **Biographies** – A brief biographical sketch of the PI (*2-page limit*) and co-investigators (*1 page*). The role of each co-investigator should be clearly defined. Conflict of interest information for each PI and Co-I should be included (but do not count toward the page limits).

10. **Other (Optional)** – Additional appendices/information may be included; however, ***note that reviewers are not required to read appendices***.

Appendix D

Links

Observatory contacts: https://arm.gov/connect-with-arm/organization/associate-director-for-operations and then click “Atmospheric Observatory Management”.

ARM UAS and TBS operational requirements: https://www.arm.gov/publications/programdocs/doe-sc-arm-19-022.pdf

www.arm.gov

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